

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* WILLIAM E. KLUNK,  
CHESTER A. MATHIS JR., and  
YANMING WANG

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Appeal 2011-004879  
Application 12/046,070  
Technology Center 1600

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Before ERIC GRIMES, JEFFREY N. FREDMAN, and  
STEPHEN WALSH, *Administrative Patent Judges*.

FREDMAN, *Administrative Patent Judge*.

DECISION ON APPEAL

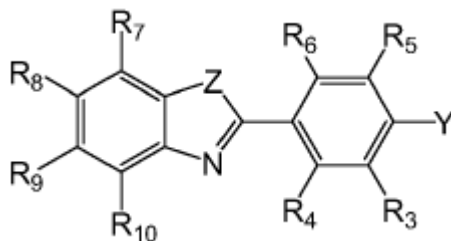
This is an appeal under 35 U.S.C. § 134 involving claims to a thioflavin derivative compound. The Examiner rejected the claims as obvious. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

*Statement of the Case*

*The Claims*

Claims 8 and 37 are on appeal<sup>1</sup> and read as follows:

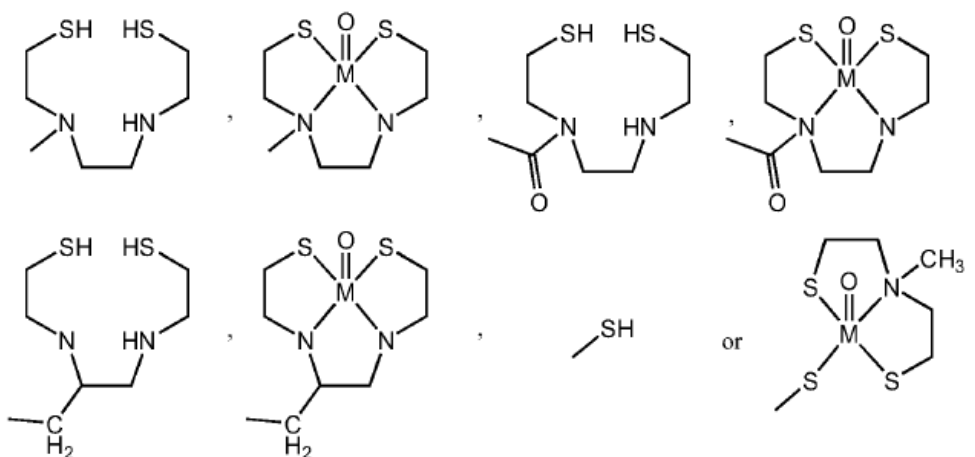
8. An amyloid binding compound of the following formula or a water soluble, non-toxic salt thereof:



wherein Y is  $\text{NR}^1\text{R}^2$ ; Z is S;  $\text{R}^1$  is H;

wherein  $\text{R}^2$  is selected from the group consisting of a lower alkyl group,  $(\text{CH}_2)_n\text{OR}'$  (wherein  $n=1, 2$ , or  $3$  and  $\text{R}'$  is H or a lower alkyl group),  $\text{CF}_3$ ,  $\text{CH}_2\text{-CH}_2\text{X}$ ,  $\text{CH}_2\text{-CH}_2\text{-CH}_2\text{X}$  (wherein  $\text{X}=\text{F}, \text{Cl}, \text{Br}$  or  $\text{I}$ ),  $\text{R}_{\text{ph}}$ , and  $(\text{CH}_2)_n\text{R}_{\text{ph}}$  (wherein  $n = 2, 3$ , or  $4$ )  $\text{R}_{\text{ph}}$  represents an optionally substituted phenyl group); or

wherein  $\text{R}^2$  is a chelating group (with or without a chelated metal group) of the form W-L, wherein W is -  $(\text{CH}_2)_n$  where  $n=2,3,4$ , or  $5$ ; and L is:



<sup>1</sup> Claims 2-7, 9-12, 14-28, 30-33, and 35 are withdrawn and claims 13, 29, 34, and 36 stand as objected (*see* App. Br. 5).

wherein M is selected from the group consisting of Tc and Re;

$R^3$  is selected from the group consisting of H, F, Cl, Br, I, a lower alkyl group,  $(CH_2)_nOR'$  (wherein  $n=1, 2$ , or  $3$ ),  $CF_3$ ,  $CH_2-CH_2X$ ,  $O-CH_2-CH_2X$ ,  $CH_2-CH_2-CH_2X$ ,  $O-CH_2-CH_2-CH_2X$ , (wherein  $X=F, Cl, Br$  or  $I$ ),  $CN$ ,  $(C=O)-R'$ ,  $NO_2$ ,  $(C=O)N(R')_2$ ,  $O(CO)R'$ ,  $OR'$ ,  $SR'$ ,  $COOR'$ ,  $R_{ph}$ ,  $CR'=CR'-R_{ph}$ ,  $CR_2'-CR_2'-R_{ph}$  (wherein  $R'$  is H or a lower alkyl group and  $R_{ph}$  represents an optionally substituted phenyl group) and a tri-alkyl tin;

$R^4$  is selected from the group consisting of H, F, Cl, Br, I, a lower alkyl group,  $(CH_2)_nOR'$  (wherein  $n=1, 2$ , or  $3$ ),  $CF_3$ ,  $CH_2-CH_2X$ ,  $O-CH_2-CH_2X$ ,  $CH_2-CH_2-CH_2X$ ,  $O-CH_2-CH_2-CH_2X$ , (wherein  $X=F, Cl, Br$  or  $I$ ),  $CN$ ,  $(C=O)-R'$ ,  $N(R')_2$ ,  $NO_2$ ,  $(C=O)N(R')_2$ ,  $O(CO)R'$ ,  $OR'$ ,  $SR'$ ,  $COOR'$ ,  $R_{ph}$ ,  $CR'=CR'-R_{ph}$ ,  $CR_2'-CR_2'-R_{ph}$  (wherein  $R'$  is H or a lower alkyl group and  $R_{ph}$  represents an optionally substituted phenyl group), and a tri-alkyl tin;

$R^5$  is selected from the group consisting of H, F, Cl, Br, I, a lower alkyl group,  $(CH_2)_nOR'$  (wherein  $n=1, 2$ , or  $3$ ),  $CF_3$ ,  $CH_2-CH_2X$ ,  $O-CH_2-CH_2X$ ,  $CH_2-CH_2-CH_2X$ ,  $O-CH_2-CH_2-CH_2X$ , (wherein  $X=F, Cl, Br$  or  $I$ ),  $CN$ ,  $(C=O)-R'$ ,  $NO_2$ ,  $(C=O)N(R')_2$ ,  $O(CO)R'$ ,  $OR'$ ,  $SR'$ ,  $COOR'$ ,  $R_{ph}$ ,  $CR'=CR'-R_{ph}$ ,  $CR_2'-CR_2'-R_{ph}$  (wherein  $R'$  is H or a lower alkyl group and  $R_{ph}$  represents an optionally substituted phenyl group), and a tri-alkyl tin;

$R^6$  is selected from the group consisting of H, F, Cl, Br, I, a lower alkyl group,  $(CH_2)_nOR'$  (wherein  $n=1, 2$ , or  $3$ ),  $CF_3$ ,  $CH_2-CH_2X$ ,  $O-CH_2-CH_2X$ ,  $CH_2-CH_2-CH_2X$ ,  $O-CH_2-CH_2-CH_2X$ , (wherein  $X=F, Cl, Br$  or  $I$ ),  $CN$ ,  $(C=O)-R'$ ,  $N(R')_2$ ,  $NO_2$ ,  $(C=O)N(R')_2$ ,  $O(CO)R'$ ,  $OR'$ ,  $SR'$ ,  $COOR'$ ,  $R_{ph}$ ,  $CR'=CR'-R_{ph}$ ,  $CR_2'-CR_2'-R_{ph}$  (wherein  $R'$  is H or a lower alkyl group and  $R_{ph}$  represents an optionally substituted phenyl group), and a tri-alkyl tin;

$R^7$  is selected from the group consisting of H, F, Cl, Br, I, a lower alkyl group,  $(CH_2)_nOR'$  (wherein  $n=1$ ,

2, or 3),  $\text{CF}_3$ ,  $\text{CH}_2\text{-CH}_2\text{X}$ ,  $\text{O-CH}_2\text{-CH}_2\text{X}$ ,  $\text{CH}_2\text{-CH}_2\text{-CH}_2\text{X}$ ,  $\text{O-CH}_2\text{-CH}_2\text{-CH}_2\text{X}$ , (wherein  $\text{X}=\text{F}$ ,  $\text{Cl}$ ,  $\text{Br}$  or  $\text{I}$ ),  $\text{CN}$ ,  $(\text{C}=\text{O})\text{-R}'$ ,  $\text{N}(\text{R}')_2$ ,  $\text{NO}_2$ ,  $(\text{C}=\text{O})\text{N}(\text{R}')_2$ ,  $\text{O}(\text{CO})\text{R}'$ ,  $\text{OR}'$ ,  $\text{SR}'$ ,  $\text{COOR}'$ ,  $\text{R}_{\text{ph}}$ ,  $\text{CR}'=\text{CR}'\text{-R}_{\text{ph}}$ ,  $\text{CR}_2'\text{-CR}_2'\text{-R}_{\text{ph}}$  (wherein  $\text{R}'$  is  $\text{H}$  or a lower alkyl group and  $\text{R}_{\text{ph}}$  represents an optionally substituted phenyl group), and a tri-alkyl tin;

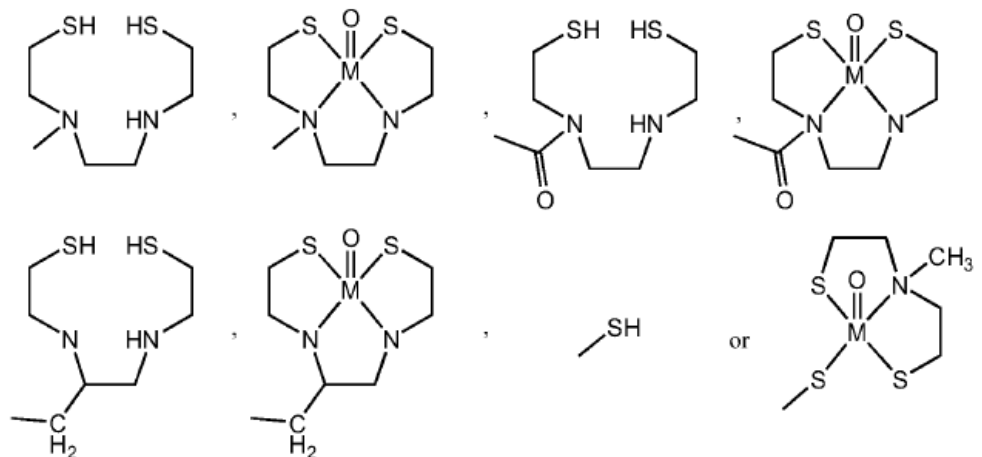
$\text{R}^8$  is selected from the group consisting of  $\text{H}$ ,  $\text{F}$ ,  $\text{Cl}$ ,  $\text{Br}$ ,  $\text{I}$ , ethyl, propyl, butyl,  $(\text{CH}_2)_n\text{OR}'$  (wherein  $n=1, 2$ , or  $3$ ),  $\text{CF}_3$ ,  $\text{CH}_2\text{-CH}_2\text{X}$ ,  $\text{O-CH}_2\text{-CH}_2\text{X}$ ,  $\text{CH}_2\text{-CH}_2\text{-CH}_2\text{X}$ ,  $\text{O-CH}_2\text{-CH}_2\text{-CH}_2\text{X}$ , (wherein  $\text{X}=\text{F}$ ,  $\text{Cl}$ ,  $\text{Br}$  or  $\text{I}$ ),  $\text{CN}$ ,  $(\text{C}=\text{O})\text{-R}'$ ,  $\text{N}(\text{R}')_2$ ,  $\text{NO}_2$ ,  $(\text{C}=\text{O})\text{N}(\text{R}')_2$ ,  $\text{O}(\text{CO})\text{R}'$ ,  $\text{OR}'$ ,  $\text{SR}'$ ,  $\text{COOR}'$ ,  $\text{R}_{\text{ph}}$ ,  $\text{CR}'=\text{CR}'\text{-R}_{\text{ph}}$ ,  $\text{CR}_2'\text{-CR}_2'\text{-R}_{\text{ph}}$  (wherein  $\text{R}'$  is  $\text{H}$  or a lower alkyl group and  $\text{R}_{\text{ph}}$  represents an optionally substituted phenyl group), and a tri-alkyl tin;

$\text{R}^9$  is selected from the group consisting of  $\text{H}$ ,  $\text{F}$ ,  $\text{Cl}$ ,  $\text{Br}$ ,  $\text{I}$ , a lower alkyl group,  $(\text{CH}_2)_n\text{OR}'$  (wherein  $n=1, 2$ , or  $3$ ),  $\text{CF}_3$ ,  $\text{CH}_2\text{-CH}_2\text{X}$ ,  $\text{O-CH}_2\text{-CH}_2\text{X}$ ,  $\text{CH}_2\text{-CH}_2\text{-CH}_2\text{X}$ ,  $\text{O-CH}_2\text{-CH}_2\text{-CH}_2\text{X}$ , (wherein  $\text{X}=\text{F}$ ,  $\text{Cl}$ ,  $\text{Br}$  or  $\text{I}$ ),  $\text{CN}$ ,  $(\text{C}=\text{O})\text{-R}'$ ,  $\text{N}(\text{R}')_2$ ,  $\text{NO}_2$ ,  $(\text{C}=\text{O})\text{N}(\text{R}')_2$ ,  $\text{O}(\text{CO})\text{R}'$ ,  $\text{OR}'$ ,  $\text{SR}'$ ,  $\text{COOR}'$ ,  $\text{R}_{\text{ph}}$ ,  $\text{CR}'=\text{CR}'\text{-R}_{\text{ph}}$ ,  $\text{CR}_2'\text{-CR}_2'\text{-R}_{\text{ph}}$  (wherein  $\text{R}'$  is  $\text{H}$  or a lower alkyl group and  $\text{R}_{\text{ph}}$  represents an optionally substituted phenyl group), and a tri-alkyl tin;

$\text{R}^{10}$  is selected from the group consisting of  $\text{H}$ ,  $\text{F}$ ,  $\text{Cl}$ ,  $\text{Br}$ ,  $\text{I}$ , a lower alkyl group,  $(\text{CH}_2)_n\text{OR}'$  (wherein  $n=1, 2$ , or  $3$ ),  $\text{CF}_3$ ,  $\text{CH}_2\text{-CH}_2\text{X}$ ,  $\text{O-CH}_2\text{-CH}_2\text{X}$ ,  $\text{CH}_2\text{-CH}_2\text{-CH}_2\text{X}$ ,  $\text{O-CH}_2\text{-CH}_2\text{-CH}_2\text{X}$ , (wherein  $\text{X}=\text{F}$ ,  $\text{Cl}$ ,  $\text{Br}$  or  $\text{I}$ ),  $\text{CN}$ ,  $(\text{C}=\text{O})\text{-R}'$ ,  $\text{N}(\text{R}')_2$ ,  $\text{NO}_2$ ,  $(\text{C}=\text{O})\text{N}(\text{R}')_2$ ,  $\text{O}(\text{CO})\text{R}'$ ,  $\text{OR}'$ ,  $\text{SR}'$ ,  $\text{COOR}'$ ,  $\text{R}_{\text{ph}}$ ,  $\text{CR}'=\text{CR}'\text{-R}_{\text{ph}}$ ,  $\text{CR}_2'\text{-CR}_2'\text{-R}_{\text{ph}}$  (wherein  $\text{R}'$  is  $\text{H}$  or a lower alkyl group and  $\text{R}_{\text{ph}}$  represents an optionally substituted phenyl group), and a tri-alkyl tin;

or one of  $\text{R}^3\text{-R}^{10}$  is a chelating group (with or without a chelated metal group) of the form  $\text{W-L}$  or  $\text{V-W-L}$ , wherein  $\text{V}$  is selected from the group consisting of

-COO-, -CO-, -CH<sub>2</sub>O- and -CH<sub>2</sub>NH-; W is -(CH<sub>2</sub>)<sub>n</sub> where n=0,1,2,3,4, or 5; and L is:



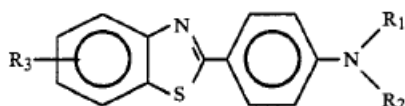
wherein M is selected from the group consisting of Tc and Re.

37. The compound of claim any one of claims 2-12, wherein the compound binds to A $\beta$  with a dissociation constant ( $K_D$ ) between 0.0001 and 10.0 $\mu$ M when measured by binding to synthetic A $\beta$  peptide or Alzheimer's Disease brain tissue.

### *The issue*

The Examiner rejected claims 8 and 37 under 35 U.S.C. § 103(a) as obvious over Scheler<sup>2</sup> (Ans. 5-7).

The Examiner finds that Scheler “discloses compounds of the formula:



<sup>2</sup> Siegfried Scheler, US 4,540,648, issued Sep. 10, 1985.

wherein  
R<sub>1</sub> denotes hydrogen, alkyl or aralkyl,  
R<sub>2</sub> denotes hydrogen or an optionally substituted alkyl,  
aralkyl, aryl, pyridylalkyl, carbalkyl, carboxyalkyl,  
carboxyaryl, carbamoyl, or sulfamoyl radical, or  
R<sub>1</sub> and R<sub>2</sub> denote members of a heterocyclic radical,  
and  
R<sub>3</sub> denotes hydrogen or alkyl.

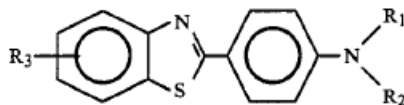
(Ans. 5). The Examiner finds “both Appellant and Scheler disclose overlapping subject matter when R1 = alkyl; R2 = hydrogen; and R3 = hydrogen” (Ans. 6). The Examiner finds that “if the prior art teaches the identical chemical structure, the properties Appellant discloses and/or claims are necessarily present are applicable to both the prior art and Appellant's product” (Ans. 6).

Appellants contend that Scheler’s preferences “(1) and (3) would have led the skilled artisan away from the present invention, whilst (2) represents only a minor contraction of a larger genus, formula I, which fails even to hint at the claimed genus” (App. Br. 14). Appellants contend that “[n]either *Petering* nor related case law attributes to the person of ordinary skill an ability ‘at once [to] envisage’ a subgenus or compound where, as here, countervailing facts point that person away from the claimed subgenus” (App. Br. 14).

The issue with respect to this rejection is: Does the evidence of record support the Examiner's conclusion that Scheler renders obvious the compound of claim 1?

## Findings of Fact

1. Scheler teaches a benzothiazole compound of the formula:



wherein

R<sub>1</sub> denotes hydrogen, alkyl or aralkyl,

R<sub>2</sub> denotes hydrogen or an optionally substituted alkyl, aralkyl, aryl, pyridylalkyl, carbalkyl, carboxyalkyl, carboxyaryl, carbamoyl, or sulfamoyl radical, or

R<sub>1</sub> and R<sub>2</sub> denote members of a heterocyclic radical, and

R<sub>3</sub> denotes hydrogen or alkyl.

(Scheler, abstract).

2. Scheler teaches that “[p]articularly preferred are those benzothiazole compounds of formula I in which R<sub>1</sub> and R<sub>2</sub> stand for hydrogen and R<sub>3</sub> stands for hydrogen or a methyl group, or in which R<sub>1</sub> stands for hydrogen or a methyl group” (Scheler, col. 6, ll. 22-26).

### *Principles of Law*

The analysis for obviousness of chemical variations is based on a long line of Federal Circuit and CCPA decisions. In *In re Dillon*, 919 F.2d 688, 696 (Fed. Cir. 1990), the Federal Circuit noted:

In brief, the cases establish that if an examiner considers that he has found prior art close enough to the claimed invention to give one skilled in the relevant chemical art the motivation to make close relatives (homologs, analogs, isomers, etc.) of the prior art compound(s), then there arises what has been called a presumption of obviousness or a *prima facie* case of obviousness. *In re Henze*, 181 F.2d 196, 37 CCPA 1009, 85 USPQ 261, (CCPA 1950); *In re Hass*, 141 F.2d 122, 127, 130, 31 CCPA 895, 60 USPQ 544, 548, 552 (CCPA 1944). The burden then shifts to the applicant, who then can present arguments and/or data to show that what appears to be obvious, is not in fact that, when the invention is looked at as a whole. *In re Papesch*, 315 F.2d 381, 50 CCPA 1084137 USPQ 43 (CCPA 1963). The cases

of *Hass* and *Henze* established the rule that, unless an applicant showed that the prior art compound lacked the property or advantage asserted for the claimed compound, the presumption of unpatentability was not overcome.

### *Analysis*

The current facts fall squarely within the ambit of *Dillon*, *Henze* and *Hass*. The formula of claim 8 expressly encompasses benzothiazole compounds where  $R^3$ - $R^{10}$  are hydrogen,  $R^1$  is H, Z is S, and  $R^2$  is a lower alkyl which encompasses a methyl group (*see* Claim 8). Scheler teaches benzothiazole compounds where  $R^3$ - $R^{10}$  are hydrogen, and Z is S (FF 1). Scheler teaches, and prefers, compounds where Scheler's  $R^1$  is hydrogen or methyl and  $R^2$  and  $R^3$  are hydrogen (FF 2). Further, since there is free rotation around the carbon-nitrogen bond between the benzyl ring and the "Y" group, the positions of  $R^1$  and  $R^2$  are interchangeable.

Thus, Scheler teaches a genus of benzothiazole compounds which includes specific species which anticipate the instantly claimed genus of Claim 8 (FF 1-2). Scheler teaches that certain of these species are preferred (FF 2).

Appellants contend that Scheler's preferences "(1) and (3) would have led the skilled artisan away from the present invention, whilst (2) represents only a minor contraction of a larger genus, formula I, which fails even to hint at the claimed genus" (App. Br. 14).

We are not persuaded. Scheler prefers a particular set of compounds, not a "myriad of possibilities". *See Pfizer, Inc. v. Apotex, Inc.* 480 F.3d 1348, 1362 (Fed. Cir. 2007) (rejecting a similar argument).

The presence of additional compounds does not represent a teaching away. There is nothing in Scheler which disparages, discourages, or otherwise dissuades the ordinary artisan from selecting the particular species which would anticipate, and therefore render obvious, instant claim 8. Like our appellate reviewing court, “[w]e will not read into a reference a teaching away from a process where no such language exists.” *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1364 (Fed. Cir. 2006).

Appellants contend that “[n]either *Petering* nor related case law attributes to the person of ordinary skill an ability ‘at once [to] envisage’ a subgenus or compound where, as here, countervailing facts point that person away from the claimed subgenus” (App. Br. 14).

We agree with Appellants that the *Petering* analysis is misplaced in this situation. However, Scheler’s disclosure of a genus of benzothiazole compounds which includes and prefers species overlapping with the claimed genus is sufficient to support the Examiner’s prima facie case of obviousness. As in *Dillon*, the Examiner has found prior art in this case which is close enough to the claimed invention to provide the skilled artisan with motivation to make close relatives of the prior art compounds. *Dillon*, 919 F.2d at 696. The case is also consistent with *Arkley*, since the Examiner properly did not make an anticipation rejection involving picking and choosing, but rather made an obviousness rejection where *Arkley* states that:

Such picking and choosing may be entirely proper in the making of a 103, obviousness rejection, where the applicant must be afforded an opportunity to rebut with objective

evidence any inference of obviousness which may arise from the similarity of the subject matter which he claims to the prior art.

*In re Arkley*, 455 F.2d 586, 587-588 (CCPA 1972).

We need not address such rebuttal evidence since Appellants have not provided any evidence to rebut the Examiner's *prima facie* case of obviousness. *See Dillon*, 919 F.2d at 692-93 ("Such rebuttal or argument can consist of a comparison of test data showing that the claimed compositions possess unexpectedly improved properties or properties that the prior art does not have.").

#### SUMMARY

In summary, we affirm the rejection of claim 8 under 35 U.S.C. § 103(a) as obvious over Scheler. Pursuant to 37 C.F.R. § 41.37(c)(1)(vii), we also affirm the rejection of claim 37 as this claim was not argued separately.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

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